

Appl. No. 10/799,153

Attorney Docket No. 81864.0034

Amdt. Dated April 14, 2006

Customer No.: 26021

Reply to Office Action of December 14, 2005

REMARKS

This application has been carefully reviewed in light of the Office Action dated December 14, 2005. Claims 1-7 and 9 remain in this application. Claim 1 is the independent Claim. Claims 1 and 9 have been amended. Claim 8 has been canceled without prejudice. It is believed that no new matter is involved in the amendments or arguments presented herein. Reconsideration and entrance of the amendment in the application are respectfully requested.

Double Patenting Rejections

Claims 1 to 9 were rejected under nonstatutory obviousness-type double patenting over claims 1-5 of U.S. Patent No. 6,811,620 (Ishizaka); Claims 1-9 were provisionally rejected under nonstatutory obviousness-type double patenting over claims 1-7 of copending Application No. 10/675,230 (Nishizawa), and 1-11 of copending Application No. 10/675,912 (Nishizawa II).

In response, Applicant is submitting concurrently a Terminal Disclaimer over Ishizaka. Recordation and withdrawal of the above rejections are respectfully request.

Art-Based Rejections

Claims 1, 2 and 5 were rejected under 35 U.S.C. § 102(b) over each of following IDS documents submitted on June 6, 2005: "Microstructure of Zr containing NdFeB," IEEE Transactions on Magnetics (Kim); and "The Influence of ZrO₂ Addition on the Microstructure and the Magnetic Properties of Nd-Dy-Fe-B Magnets," Journal of Magnetism and Magnetic Materials (Besenicar); Claims 3, 4, and 6 were rejected under 102(b) or 35 U.S.C. § 103(a) over each of Kim and Bessenicar; Claims 1-9 were rejected under § 103(a) over each of Ishizaka, Nishizawa, and Nishizawa II.

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With regard to the § 103(a) rejection over Ishizaka, Nishizawa, and Nishizawa II, Applicant notes the references constitute prior art only under 35 U.S.C. 102(e), and are assigned to the same owner as the present application. Accordingly, Applicant is submitting concurrently a statement showing the invention of present application and the above references are commonly assigned at the time of invention. Recordation of the statement and withdrawal of the § 103(a) rejection over Ishizaka, Nishizawa, and Nishizawa II are thus respectfully requested.

Applicant respectfully traverses the rest of the rejections, and submits that the claims herein are patentable in light of the clarifying amendments above and the arguments below.

The Kim Reference

Kim is directed to micro structure of Zr containing Nd-Fe-B alloy. According to Kim, simultaneous additions of Co, Al, and Zr to Nd(Dy)-Fe-B alloy substantially improves the coercivity, corrosion resistance, and Curie temperature. (*See, Kim; Abstract*).

The Besenicar Reference

Besenicar is directed to addition of ZrO₂ to Nd-Dy-Fe-B magnet. According to Besenicar, the addition improves the magnetic properties, temperature coefficient, and corrosion improvement of the base alloy. (*See, Besenicar; Abstract*).

The Claims are Patentable Over the Cited References

The present application is generally directed to an R-T-B rare earth permanent magnet.

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As defined by amended independent Claim 1, an R-T-B system rare earth permanent magnet having a sintered body, includes a main phase having of an $R_2T_{14}B$ phase. R represents one or more rare earth elements, providing that the rare earth elements include Y. T represents one or more transition metal elements essentially containing Fe, or Fe and Co. A grain boundary phase contains a higher amount of R than the main phase, wherein a platy or acicular product exists. The sintered body has a composition including of 28% to 33% by weight of R, 0.5% to 1.5% by weight of B, 0.03% to 0.3% by weight of Al, 0.3 or less by weight (excluding 0) of Cu, 0.05% to 0.2% by weight of Zr, 4% or less by weight (excluding 0) of Co, and the balance substantially being Fe.

The applied references do not disclose or suggest the above features of the present invention as defined by the claims of present invention. In particular, the applied references do not disclose or suggest, "said sintered body has a composition consisting essentially of 28% to 33% by weight of R, 0.5% to 1.5% by weight of B, 0.03% to 0.3% by weight of Al, 0.3 or less by weight (excluding 0) of Cu, 0.05% to 0.2% by weight of Zr, 4% or less by weight (excluding 0) of Co, and the balance substantially being Fe" as required by amended independent Claim 1.

With regard to the 102(b) rejection over of Kim, Applicant notes that reference is a scientific article describing the microstructure of Zr containing Nd(Dy)-Fe-B. The Nd(Dy)-Fe-B alloys of Kim may also contain Co and Al (*see Kim; Abstract and Table 1*). However, Kim does not disclose a sintered body which contains 0.3 wt.% or less Cu (excluding 0), 0.03 to 0.3 wt.% Al, 4 wt.% or less Co (excluding 0) and 0.05 to 0.2 wt.% Zr. Moreover, the alloy composition disclosed in Kim, has 5 wt.% Co, 0.35 wt.% Al, and 1.0 wt.% Zr (*see Kim; Table 1, alloy no. 3*). Accordingly, Kim does not disclose or suggest the features recited in amended independent Claim 1.

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With regard to the 102(b) rejection over of Besenicar, Applicant notes that reference is directed to the effect of ZrO_2 addition on the microstructure and the magnetic properties of Nd-Dy-Fe-B magnets. According to Besenicar, samples were prepared by arc-melting the basic alloys Nd-Fe, Dy-Fe and Fe-B and Fe in a pure Ar atmosphere. However, Besenicar does not disclose or suggest an alloy composition having 0.3 wt% or less Cu (excluding O), 0.03 to 0.3 wt.% Al, 4 wt.% or less Co (excluding O) and 0.05 to 0.2 wt.% Zr. In particular, samples disclosed by Besenicar were prepared with 1 wt.% ZrO_2 and without any Al or Co. Moreover, when 1 wt.% ZrO_2 is added to the alloy composition, Zr of approximately 0.74 wt.% is contained in the sintered magnet. Accordingly, Besenicar does not disclose or suggest the features recited in amended independent Claim 1.

With regard to the 103(a) rejection over Kim, Applicant notes alloy no. 3 of Kim is used for the preparation of a Nd-Fe-B magnet, and contains Co, Al, and Zr. The R-T-B system rare earth permanent magnet defined by amended independent Claim 1 differs from the Nd-Fe-B magnet of alloy no. 3 of Kim. In particular, amended independent Claim 1 requires that the sintered body has a composition containing 0.3 wt.% Cu (excluding O), 0.03 to 0.3 wt.% Al, 4 wt.% or less Co (excluding O), and 0.05 to 0.2 wt.% Zr. Accordingly, the R-T-B system rare earth magnet of amended independent Claim 1 contains less Zr, less Co, and less Al than the magnet disclosed by Kim (alloy no. 3), and additionally contains Cu which is not contained in the alloy of Kim.

The inclusion of Al and Cu within the ranges recited in amended independent Claim 1 imparts a high coercive force, a strong corrosion resistance, and improves temperature stability of the magnetic properties of the permanent magnet. (*See, Specification; Page 18, line 24 to page 19, line 1*). Furthermore, the range of Zr of 0.05 to 0.2 wt.% recited in amended independent Claim is patentably distinct from

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Kim, because a higher amount of Zr, such as 1 wt.% disclosed by Kim, would greatly decrease the residual magnetic flux.

The specific R-T-B system rare earth permanent magnet according to amended independent Claim 1 is not disclosed in Kim. Furthermore, Kim does not disclose or suggest a sintered body containing 0.3 wt.% Cu (excluding 0), 0.03 to 0.3 wt.% Al, 4 wt.% or less Co (excluding 0), and 0.05 to 0.2 wt.% Zr resulting in improved magnetic properties. Accordingly, Kim does not anticipate or render obvious the features of amended independent Claim 1.

With regard to the 103(a) rejection over Besenicar, Applicant notes Besenicar does not disclose or suggest a sintered magnet containing in combination 0.3 wt.% Cu (excluding 0), 0.03 to 0.3 wt.% Al, 4 wt.% or less Co (excluding 0), and 0.05 to 0.2 wt.% Zr. Moreover, Besenicar does not disclose or suggest that improved magnetic properties may result when using a sintered body having a composition as defined in amended independent Claim 1. Accordingly, Besenicar does not anticipate or render obvious the features of amended independent Claim 1.

Since the applied references fail to disclose, teach or suggest the above features recited in amended independent Claim 1, those references cannot be said to anticipate or render obvious the invention which is the subject matter of that claim.

Accordingly, amended independent Claim 1 is believed to be in condition for allowance and such allowance is respectfully requested.

The remaining claims depend either directly or indirectly from amended independent Claim 1, and recite additional features of the invention which are neither disclosed nor fairly suggested by the applied references and are therefore also believed to be in condition for allowance, and such allowance is respectfully requested.

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Conclusion

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6809 to discuss the steps necessary for placing the application in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
HOGAN & HARTSON L.L.P.

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By:



Dariush G. Adli
Registration No. 51,386
Attorney for Applicant(s)

500 South Grand Avenue, Suite 1900
Los Angeles, California 90071
Phone: 213-337-6700
Fax: 213-337-6701